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MASSACHUSETTS DAIRY BUREAU BULLETIN.

MASSACHUSETTS CREAMERY INTERESTS.

MASSACHUSETTS CREAMERY ASSOCIATION.
DAIRY INSTITUTES. BUTTER EXHIBITION.
MASSACHUSETTS CREAMERIES.

COMPILED BY
GEO. M. WHITAKER, A.M.,
Acting Executive Officer of the Dairy Bureau.

BOSTON :
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
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BY TRANSFER.
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Sept. 19, 1910.
M. W. M. M.

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BUTTER FACTORIES IN MASSACHUSETTS.

<i>Amherst</i> , co-operative,	WILLIAM A. MAGILL, treasurer.
<i>Amherst</i> , Bay State, co-operative,	C. E. WAKEFIELD, treasurer.
<i>Andover</i> ,	Out of business.
<i>Ashby</i> .	
<i>Ashfield</i> , co-operative,	GEO. G. HENRY, superintendent.
<i>Belchertown</i> , co-operative,	A. W. MORSE, president.
<i>Boston</i> , Austen Street,	BOSTON DAIRY COMPANY.
<i>Boston</i> , Rutherford Avenue,	DAVID WHITING & SONS.
<i>Bridgewater</i> , Plymouth County, co-operative,	P. O. CLARK, treasurer.
<i>Cambridge</i> , Massachusetts Avenue,	C. BRIGHAM COMPANY.
<i>Charlemont</i> , proprietary,	T. M. TOTMAN.
<i>Cheshire</i> , Greylock, P. O. address, Adams, co-operative,	M. L. CURTIS, president.
<i>Chester</i> , co-operative but run as proprietary,	SPRINGFIELD MILK ASSOCIATION.
<i>Conway</i> , co-operative,	H. W. BILLINGS, treasurer.
<i>Cummington</i> , co-operative,	I. H. STEELE, superintendent.
<i>Easthampton</i> , Hampton, co-operative,	W. H. WRIGHT, treasurer.
<i>Egremont</i> , co-operative,	H. O. HARRINGTON, superintendent.
<i>Fitchburg</i> , proprietary.	
<i>Granby</i> , co-operative,	G. L. WITT, president.
<i>Groton</i> , co-operative.	
<i>Groton</i> , Lawrence Creamery, proprietary,	SWALLOW & Co.
<i>Hampden</i> , Springfield Mountain,	Out of business.
<i>Hardwick</i> , proprietary.	
<i>Heath</i> , proprietary.	
<i>Hinsdale</i> , co-operative,	G. M. SOLOMON, Treasurer.
<i>Ipswich</i> ,	Out of business.
<i>Lee</i> , co-operative,	H. L. SMITH, treasurer.
<i>Leominster</i> .	
<i>Lowell</i> ,	MILK ASSOCIATION.
<i>Marlborough</i> , proprietary.	
<i>Millbury</i> , singletary, co-operative,	C. N. WOODBURY.
<i>Mill River</i> , Konkapot, co-operative,	E. WHEELER, treasurer.
<i>Monson</i> , co-operative,	O. E. BRADWAY.
<i>Montague</i> , co-operative,	A. W. LYMAN.
<i>Monterey</i> , Berkshire Hills, co-operative,	J. A. TOWNSEND, treasurer.
<i>New Boston</i> , Berkshire, co-operative,	F. M. RUGG, treasurer.
<i>New Salem</i> , co-operative,	WM. A. MOORE, superintendent.
<i>North Brookfield</i> , proprietary,	H. E. CUMMINGS.
<i>Northfield</i> , co-operative,	L. R. SMITH, treasurer.
<i>North Orange</i> , co-operative,	G. H. MOORE, manager.

<i>North Oxford</i> , Cold Brook, co-operative, . . .	WALTER A. LOVETT, treasurer.
<i>Phillipston</i> , Cloverleaf, proprietary, . . .	F. T. WARD.
<i>Rutland</i> ,	Out of business.
<i>Sheffield</i> , proprietary,	GRAY, LEE & Co.
<i>Shelburne Falls</i> ,	Out of business.
<i>Southborough</i> , proprietary,	DEERFOOT FARM.
<i>Springfield</i> ,	{ MILK ASSOCIATION.
	{ CHAS. M. BULL, manager.
<i>State Line</i> , proprietary,	JAMES FINNEY.
<i>Uxbridge</i> , Blackstone Valley, co-operative, . . .	N. T. ABELLS, manager.
<i>Warren</i> .	
<i>Wellesley</i> , co-operative,	EDWARD LYON, treasurer.
<i>West Acton</i> , co-operative.	
<i>West Dudley</i> ,	Out of business.
<i>West Newbury</i> .	
<i>Williamsburg</i> , co-operative,	HENRY F. HILL, treasurer.
<i>Worcester</i> , Wachusett, proprietary.	
<i>Worthington</i> , co-operative,	C. F. BURR, treasurer.

MASSACHUSETTS CREAMERY ASSOCIATION.

OFFICERS.

President, CHARLES M. BULL, Springfield, Mass.

Vice-President, WILLIAM A. MOORE, Millington, Mass.

Secretary and Treasurer, A. W. MORSE, Belchertown, Mass.

Directors, W. H. WRIGHT, Easthampton, Mass.; A. M. LYMAN, Montague, Mass.; T. J. THURSTON, Amherst, Mass.; GEORGE L. WITT, Granby, Mass.; M. L. CURTIS, Adams, Mass.

LIST OF MEMBERS.

1. Conway Creamery, Conway, Mass.
 2. Amherst Creamery, Amherst, Mass.
 3. Ashfield Creamery, Ashfield, Mass.
 4. Adams Creamery, Adams, Mass.
 5. Belchertown Creamery, Belchertown, Mass.
 6. Cummington Creamery, Cummington, Mass.
 7. Chester Creamery, Chester, Mass.
 8. Easthampton Creamery, Easthampton, Mass.
 9. Granby Creamery, Granby, Mass.
 10. Montague Creamery, Montague, Mass.
 11. New Salem Creamery, Millington, Mass.
 12. Northfield Creamery, Northfield, Mass.
 13. Springfield Creamery, Springfield, Mass.
 14. Williamsburg Creamery, Williamsburg, Mass.
 15. Worthington Creamery, Worthington, Mass.
 16. Bay State Creamery, Amherst, Mass.
 17. Hardwick Creamery, Hardwick, Mass.
 18. Charlemont Creamery, Charlemont, Mass.
- Prof. F. S. Cooley, Massachusetts Agricultural College.

CONSTITUTION AND BY-LAWS OF THE MASSACHUSETTS CREAMERY ASSOCIATION.

ARTICLE I.

This association shall be known as the Massachusetts Creamery Association.

ARTICLE II.

The object in forming this association is to protect and advance the interests of the milk producers in Massachusetts.

ARTICLE III.

Any creamery organization or individual engaged in the manufacture of butter may become a member of this association by paying the fee of two dollars and subscribing to the constitution and by-laws.

ARTICLE IV.

Any creamery may be represented in the association by more than one member, but no creamery shall have more than one vote.

ARTICLE V.

The officers of this association shall consist of a president, vice-president, secretary and treasurer, all elected by ballot, the president and secretary to be also members of the board of directors.

ARTICLE VI.

The annual meeting of this association shall be held on the second Wednesday of February, at which meeting the election of officers shall be held.

Notices of all meetings of this association shall be mailed to each member.

By-laws.

ARTICLE 1.

Meetings of the directors and members of the association shall be called by the clerk, when so directed by the president or a majority of the directors.

Three directors or five members of the association shall constitute a quorum to transact business.

ARTICLE II.

It shall be the duty of the president to preside at all meetings of the association and board of directors, and to perform all duties devolving upon such an officer.

The vice-president shall, in the absence of the president, perform the duties of the president.

ARTICLE III.

It shall be the duty of the secretary to keep the minutes of each meeting of the board of directors and the association. He shall issue all notices of meetings, and notify all members when price of butter is changed; also attend to all correspondence necessary to the good of the association.

ARTICLE IV.

The treasurer shall receive all fees and dues, giving his receipt therefor. He shall keep a correct account of all funds of the association, and shall pay all orders drawn by the secretary.

ARTICLE V.

The directors shall assess each member of the association, from time to time, for such sums as are necessary to pay the running expenses of the association.

ARTICLE VI.

Any member of this association who shall be one year in arrears for his dues, after due notice by the secretary, may be dropped from the membership of this association by vote of directors.

ARTICLE VII.

An auditing committee, consisting of two members of this association, shall be appointed by the president, who shall audit the accounts of the secretary and treasurer.

ARTICLE VIII.

The constitution and by-laws may be altered or amended by a two-thirds vote of the members present at any annual meeting.

MASSACHUSETTS DAIRY BUREAU.

The Legislature of 1891 created the Dairy Bureau of the State Board of Agriculture "in order to secure the better enforcement of the provisions of this act [an oleomargarine law], and to promote the improvement of the products of the dairy."

SECTION 11. It shall be the duty of the said bureau to investigate all dairy products and imitation dairy products bought or sold within the Commonwealth; to enforce all laws for the manufacture, transfer and sale of all dairy products and all imitation dairy products within the Commonwealth, with all the powers needed for the same; to investigate all methods of butter and cheese making in cheese factories or creameries, and to disseminate such information as shall be of service in producing a more uniform dairy product of higher grade and better quality.

The members of the Bureau are D. A. Horton of Northampton, J. Lewis Ellsworth of Worcester, and C. D. Richardson of West Brookfield. The executive officer of the Bureau *ex officio* is, by the statute, the secretary of the Board of Agriculture, Hon. J. W. Stockwell. The acting executive officer is Geo. M. Whitaker.

INSTITUTES.

In November and December, 1898, four dairy institutes were held under the auspices of the Creamery Association and Dairy Bureau. They were addressed by Dr. J. B. Lindsey of the Hatch Experiment Station, and Prof. F. S. Cooley of the Agricultural College; also by the following butter-makers: B. C. Bliss of Chester, Geo. E. Henry of Ashfield and O. Harrington of Easthampton.

The following are some of the points made by Dr. Lindsey:—

It is important to have cows of the dairy type. Special purpose cows are best. Usually a farmer can get better results by raising his own stock than by buying it. The study of the farmer should be to increase the average product of his cows. The cows at the experiment station have produced all the way from 245 to 437 pounds of butter per year. The standard should be placed at not less than 300 pounds.

More attention should be paid to cleanliness both of animals and barns. Barns should have more air and more light than the average at present. The walls should be swept several times a year and sprayed with a solution of 100 pounds of water and 4 pounds of carbolic acid. The barn should then be whitewashed.

Cream will vary in its test from day to day for reasons that are not fully understood. There is as yet a great deal of ignorance on the cause of these variations. Growing out of these institutes the experiment stations will undertake the study of these questions, and publish the results as soon as possible.

At current prices the carbonaceous feeds are cheapest to buy in the following order:—

1. Cornmeal.
2. Hominy meal and Victor corn and oat feed.
3. Quaker oat feed.
4. Oat feeds.
5. Chopped feeds.

The nitrogenous feeds rank in order of cheapness at current prices as follows:—

1. Gluten meal and gluten feeds.
2. Cotton-seed.
3. Dry brewers' grains.
4. Wheat middlings.
5. Wheat bran and middlings.
6. Wheat bran.
7. Linseed meal and H-O feeds.

A good ration consists of one-third cornmeal, one-third gluten and one-third wheat bran. Wheat bran, though not ranked high in cheapness, is advantageous to mix with others on account of bulk. About six quarts per day of this mixture can be fed to average cows. Corn furnishes the cheapest and best feeds, cornmeal leading in the carbonaceous class and gluten in the nitrogenous.

The Babcock system of paying for milk or cream is the most equitable plan there is, paying each farmer for precisely what butter fat he furnishes to the creamery.

The importance of having first-class cream gatherers should be emphasized. A cream gatherer should not be a mere truckman, but should be enough of an expert to understand the differences in the quality of cream, and to refuse to accept that which is not all right.

Butter-maker Bliss of Chester presented the importance of every creamery having one responsible manager with full powers, the necessity of the latest and best machinery and best methods, and the importance of a good butter-maker and treating him well. A cheap butter-maker is an expensive one. The Chester Creamery changed from the space system to the Babcock system five years ago, being the first creamery in the State to make the change. This imposed much extra work on the butter-maker, but it is the only correct system; by it the farmer can increase the quality of his herd, and weed out poor cows.

Butter-maker Burgess of the Granby creamery alluded particularly the aid of acid test tablets, and to the importance of stirring the cream when it is ripening. The more it is stirred the better the butter.

Mr. George Henry, the butter-maker of Ashfield creamery, read a paper on some of the trials of butter-makers. Among these are taints in cream due to sudden change of feed or to

feeding such things as cabbage, turnips, etc. More attention should be paid to cleanliness. Last year the Ashfield creamery introduced forty separators, which not only prevented waste of butter fat, but produced cleaner cream and improved quality of butter. The cleaning of dairy utensils is too much neglected; they should first be carefully rinsed in lukewarm water, then scalded and placed in racks to dry and air. Too many farmers are careless about putting in an ample supply of ice; it gives out in August, causing trouble the remainder of the season. Farmers supplying cream to a co-operative creamery should bear in mind that he who injures himself injures his neighbor. The introduction of the Babcock system of paying for milk has been a great help in locating poor cream.

Butter-maker Harrington of Easthampton emphasized the importance of co-operation in the quality of cream sent to the creamery. Any reputable butter-maker with the machinery at his disposal can make good butter; if there is a failure to do so the chances are that the fault is with some of those who supply cream. It is as much for their interest to co-operate in furnishing as fine a product as possible as it is for them to co-operate in subscribing for stock or in attending the annual meetings to elect officers and hear reports. One careless farmer in a dozen may lower the quality of the product of the whole and reduce the income of not only himself but all his brother farmers who carry cream to the same creamery. It is for the mutual advantage of every one to be as cleanly as possible in all methods; to have a good supply of ice or cool running water; to keep the cooling tank scrupulously clean; to pay every possible attention to details.

RÉSUMÉ OF ADDRESSES BY F. S. COOLEY.

Improving the Dairy Cow.

1. *Improve the Quality of Stock.* — Breed better dairy cows. Do not depend so much on purchase. Cows on the market are commonly the breeder's culls, sold for a reason. The most certain and cheapest way of securing No. 1 cows is by breeding them.

2. *Selection of a Sire.* — Not enough care is taken in choosing a breeding bull. "The bull is half the herd" is an old saying;

if grade cows are mated with a pure-bred sire he becomes three-fourths the herd. If in addition to purity of blood the bull possesses a rich inheritance from his nearest female ancestors, and is known to transmit his qualities with certainty, he becomes as a power for good not only half but nine-tenths the herd.

3. *Difference in Value between a Scrub and a Valuable Bull.* — The average farmer would pay \$3 for a heifer calf from a superior sire as quickly as \$1 for a heifer calf from a scrub. Estimate forty calves annually from each sire, one-half of them bulls at \$1 each, and the value of the get of the scrub bull is \$40, while that of the other is \$80. There is no difference in cost of feed and care. The \$40 difference in earnings will pay interest at 6 per cent, taxes at 2 per cent and depreciation at 25 per cent on \$120 difference in price of the animals. In other words, if a scrub bull is worth \$30, a first-class bull is worth \$150 as a business investment. Heifers from the scrub bull will be worth \$40 each at maturity, while those of the first-class bull will be worth \$65 each, — a cool \$25 difference. If the breeder rears ten heifers each year for four years, forty in all, this difference amounts to \$1,000 in favor of a good sire over a scrub.

4. *Qualities of a Good Bull.* — *a.* Good individuality. The first point in a bull is his own appearance. No pedigree will save a worthless specimen. He must stand on his own merits as much as on inheritance.

b. Good pedigree. The average quality of the three to seven nearest female ancestors must be high. Top crosses are most important in judging pedigree.

c. Prepotency. The demonstrated power of a bull to stamp his own high qualities on his get is of utmost importance. To this end use a bull sparingly until his first calves appear. If these seem poor dispose of him, if good, continue him in service as long as his breeding powers last. I have no patience with breeders who never keep a bull long enough to test his heifers. I know of several breeders who have lately purchased bulls from eight to eleven years of age to head fine herds.

5. *Health of Cows.* — Too little attention is given to stable sanitation and ventilation. Often cows are confined in stables with only three hundred cubic feet of air, equivalent to keeping a man in a room six feet long, two feet wide and five feet high. No constitution can stand such confinement. The reason for so much tuberculosis is just here, and the remedy, in the main, is admission of pure air and sunlight.

6. *Cleanliness.* — Neatness in producing and handling milk is often overlooked. Creameries and milkmen should regularly in-

spect dairies and adopt plans for securing greater cleanliness and sanitary precautions in the production of their milk and cream.

7. *State Inspection.* — It is unfortunate that our State has gone to such extremes in the inspection of its cattle. A system of inspection with view to removing causes of disease and promoting general health would be worth far more than the mere killing off of diseased cattle.

Variations in the Babcock Test.

1. The Babcock test is accurate and reliable. Variations are due to faulty manipulation or to variations in samples tested.

2. With regard to faulty manipulation, there should be State supervision of operators, each person doing testing on a commercial scale to be examined and licensed by proper authority.

3. Co-operation in testing would lessen chances of error, and reduce the expense of the work. If ten or a dozen creameries would combine and employ the same expert tester, dividing the expense, the work could be carried on with greater economy, and to the better satisfaction of patrons.

4. Milk varies in its butter fat, and hence in the reading of the Babcock test in many ways.

a. The more advanced the period of lactation the higher the test.

b. The shorter the time between milkings the higher the test. Regularity of milking and attendance favor quality.

c. Breed is a most potent factor in determining butter fat in milk. Individuality also plays an important part.

d. Feed has little influence on the percentage of fat in milk.

e. Age of cow affects quality of milk. Heifers give a poorer milk with first calf than after they come to maturity.

f. The first milk drawn from the udder is much poorer in fat than the strippings, the latter often testing 8 to 10 per cent., while the first milk from the same cows tests only 1 to 2 per cent. It is therefore desirable to milk cows clean, and to give sucking calves the first milk rather than the strippings.

g. Fright, fatigue, abuse, irregularity and illness all have a tendency to impoverish milk in butter fat, owing very likely to resorption or retention of the last and richest portion.

5. Cream varies in a general way in its fat content as does milk, but is subject in a greater degree to external conditions than to the milk from which it is taken.

6. The method of separation of cream determines its richness in a large degree. Separator cream is produced in all grades. Cream from shallow pans is heavy. Cooley cream is light.

7. Cooley cream varies widely in composition and is by no means a certain basis of comparison.

a. Cooley cream varies according to age, thickness, and becoming richer on standing.

b. It is thinner and larger in quantity if raised rapidly by liberal use of ice and a low temperature.

c. Jersey cows produce a heavier cream than Holstein-Friesians.

d. The season of the year and lactation period also affect the per cent of fat in cream.

Question. Mr. MORSE. Is cream from strippers which give rich milk richer or poorer than cream from fresh cows.

Answer. As cows advance in lactation the milk becomes richer, but the fat globules diminish in size. As a result, more of the milk serum is carried upwards with the fat into the cream. The cream is therefore somewhat poorer in fat but considerably more in quantity.

Question. Why do cows fall off in quality of cream during hot weather in August.

Dr. LINDSEY. Because the heat and torments of flies diminish the milk flow, and cause the cows to withhold the secretion of the milk of richest quality.

BUTTER-MAKERS' DAY.

A butter exhibition and institute were held at Amherst, at the agricultural college, Feb. 23, 1899.

In the butter exhibition there were 17 entries of creamery butter in competition for the premiums, 5 specimens of creamery butter for exhibition only, 6 samples of dairy butter for exhibition, 11 specimens from the college dairy school and 1 exhibit of American butter which had been exported and returned to this country,—41 in all. The highest score was 96.5, on a box made by a student at the dairy school. The lowest score was 83,—a sample of “renovated butter” which had been placed in the exhibition. The prizes went to the butter makers at the creameries as follows:—

1. New Salem, score 95.5.
2. Springfield, score 95.
3. North Orange, score 94.25.

The judges were Messrs. Harris of Hovey & Co., Mr. Bent of Crosby Bros. & Co., and J. Harvey White of J. H. White & Co., all of Boston and all practical handlers of butter.

The complete score is as follows:—

NAME.	Flavor.	Grain.	Color.	Salt.	Package.	Total.
Amherst,	35.00	24.00	14.00	10.00	5	88.00
North Brookfield,	36.00	25.00	15.00	10.00	5	91.00
Granby,	39.00	24.50	14.50	10.00	5	93.00
Williamsburg,	38.50	25.00	14.50	10.00	5	93.00
Greylock,	37.00	25.00	13.50	10.00	5	90.50
New Salem,	40.50	25.00	15.00	10.00	5	95.50
Chester,	35.00	25.00	15.00	10.00	5	90.00
Northfield,	35.00	25.00	14.50	10.00	5	89.50
Egremont,	36.00	25.00	14.75	10.00	5	90.75
Bay State,	38.00	24.50	15.00	10.00	5	92.50
North Orange,	40.25	25.00	14.00	10.00	5	94.25
Conway,	34.00	25.00	15.00	10.00	5	89.00
Montague,	39.00	25.00	15.00	10.00	5	94.00
Easthampton,	38.00	25.50	15.00	10.00	5	92.50
Charlemont,	38.75	25.00	15.00	10.00	5	93.75
Ashfield,	36.00	24.00	15.00	10.00	5	90.00
Springfield,	40.00	25.00	15.00	10.00	5	95.00

Creamery for Exhibition only.

NAME.	Flavor.	Grain.	Color.	Salt.	Package.	Total.
Springfield,	40.75	25.00	15.00	10.00	5	95.75
Chester,	35.00	24.50	15.00	9.50	5	89.00
Northfield,	35.50	24.50	15.00	10.00	5	90.00
Jaynes,	38.00	25.00	15.00	10.00	5	93.00
Jaynes,	36.00	25.00	15.00	10.00	5	91.00

Dairy for Exhibition only.

Talberg,	35.00	24.25	14.00	10.00	5	88.25
Lyman,	38.00	25.00	14.00	10.00	5	92.00
Leach,	38.00	24.50	13.50	10.00	5	91.00
Gray,	40.00	25.00	15.00	10.00	5	95.00
Church,	39.50	25.00	14.75	10.00	5	94.25
Pasteurized,	34.00	25.00	14.50	10.00	5	88.50

Renovated or "Process" Butter.

	30.00	23.00	15.00	10.00	5	83.00
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Dairy School.

1,	36.50	25.00	14.50	10.00	5	91.00
2,	37.00	25.00	15.00	10.00	5	92.00
3,	40.00	25.00	15.00	10.00	5	95.00
4,	38.00	24.50	14.50	9.00	5	91.50
5,	37.00	24.75	14.50	10.00	5	91.25
6,	40.00	25.00	15.00	10.00	5	95.50
7,	37.00	24.50	15.00	10.00	5	91.50
8,	41.00	25.00	15.00	10.00	5	96.00
9,	40.00	25.00	15.00	10.00	5	95.00
10,	37.50	24.50	15.00	10.00	5	92.00
11,	41.50	25.00	15.00	10.00	5	96.50

The following reports were made as to the details of manufacturing the butter exhibited. The Springfield exhibit reported on last is one that was entered for exhibition only, but that scored higher than the specimen tub in the competition.

AT WHAT TEMPERATURE WAS CREAM CHURNED?

Williamsburg—Sixty-seven degrees. *Springfield*—Fifty degrees; cream tested 43 per cent fat. *Charlemont*—Sixty-four degrees, square box churn containing 400 gallons being used. *Egremont*—Sixty-four degrees. *Granby*—Sixty-five degrees. *Montague*—Sixty degrees. *Easthampton*—Sixty-six degrees. *New Salem*—Sixty-four degrees. *North*

Brookfield — Sixty-four degrees. *Adams* — Fifty-eight degrees. *Bay State* — Sixty-six degrees. *Springfield* — Sixty-two degrees.

HOW LONG WAS IT CHURNED?

Williamsburg — Probably thirty-five minutes. *Springfield* — Thirty minutes. *Charlemont* — One hour. *Egremont* — Forty minutes. *Granby* — About thirty minutes. *Montague* — About forty-five minutes. *Easthampton* — Forty-five minutes. *New Salem* — About one hour. *North Brookfield* — Thirty minutes. *Adams* — Fifty-five minutes. *Bay State* — Thirty-five minutes. *Springfield exhibition tub* — forty minutes.

BY WHAT METHOD WAS CREAM SEPARATED?

Williamsburg — Cooley system. *Springfield* — De Laval separator. *Charlemont* — Cooley system and separator. *Egremont* — Cooley system. *Granby* — Cooley system. *Montague* — Cooley system and De Laval separator. *Easthampton* — Cooley system. *New Salem* — Cooley system. *North Brookfield* — Cooley system. *Adams* — Cooley system, De Laval and United States separators. *Bay State* — Cooley system. *Springfield exhibition tub* — Cooley system.

HOW OLD WAS CREAM WHEN IT REACHED THE CREAMERY?

Williamsburg — Oldest was four days. *Springfield* — Forty-eight hours old when ripening began. *Charlemont* — From one to four days, owing to blockaded roads. *Egremont* — Two days. *Granby* — One and two days. *Montague* — One and two days. *Easthampton* — Twelve hours. *New Salem* — Three days. *North Brookfield* — Twelve hours. *Adams* — Three days. *Bay State* — Twenty-four hours. *Springfield exhibition tub* — Cream gathered in Chester and shipped to Springfield; gathered twice a week, hence some of the cream was four days old when received at Springfield.

HOW LONG WAS THE CREAM RIPENED?

Williamsburg — Eighteen hours. *Springfield* — Twenty-four hours. *Charlemont* — Cream arrived Saturday and ripened over Sunday. *Egremont* — Over night. *Granby*

— About fifteen hours. *Montague* — About twenty-four hours. *Easthampton* — Thirteen hours. *New Salem* — Twenty hours. *North Brookfield* — Twelve hours. *Adams* — Twelve hours. *Bay State* — Twelve hours. *Springfield exhibition tub* — Thirty-six hours.

WAS ANY STARTER USED AND WHAT?

Williamsburg — Sour cream, about one gallon to thirty. *Springfield* — None. *Charlemont* — Douglas culture; we have used for two years. *Egremont* — Buttermilk. *Granby* — Buttermilk. *Montague* — None. *Easthampton* — Buttermilk. *New Salem* — Buttermilk. *North Brookfield* — None. *Adams* — None. *Bay State*. — Sour cream; one pail to three hundred and fifty gallons. *Springfield exhibition tub* — None.

WHAT WAS THE TEMPERATURE OF CREAM DURING RIPENING?

Williamsburg — Sixty-seven degrees. *Springfield* — Seventy degrees. *Charlemont* — As near sixty-four degrees as we could hold. *Egremont* — Sixty-four degrees. *Granby* — Sixty-five degrees. *Montague* — Sixty-four degrees. *Easthampton* — Sixty-six degrees. *New Salem* — Sixty-four degrees. *North Brookfield* — Sixty degrees. *Adams* — Sixty-four degrees. *Bay State* — Sixty-six degrees. *Springfield exhibition tub* — Sixty-seven degrees.

AT WHAT DEGREE OF ACIDITY WAS CREAM CHURNED?

Williamsburg — Do not know. *Springfield* — Made no test. *Charlemont* — Do not use acid test. *Egremont* — Do not know. *Granby* — Do not know; should judge from 5.5 to 6 per cent. *Montague* — Do not know. *Easthampton* — About 6 per cent. *New Salem* — Six per cent. *Springfield exhibition tub* — Six and one-half per cent.

HOW DID YOU DETERMINE WHEN CREAM WAS READY TO BE CHURNED?

Williamsburg — Judged by general appearance. *Springfield* — Judged by general appearance, thickness, smoothness, etc. *Charlemont* — By that "know how" that is

obtained by years of experience. How can the acid test fellow be all right when he has churn room for only part at a time, and the other part must wait two hours? *Granby* — By appearance. *Montague* — By taste and thickness of cream. *Easthampton* — By judgment and the Farrington test. *New Salem* — By judgment and the Farrington test. *North Brookfield* — Churned sweet cream, being short of time. *Adams* — Used my judgment. *Bay State* — By taste. *Springfield exhibition tub* — Farrington test.

COLORING MATTER.

Williamsburg — Wells, Richardson & Co., 1 dram to about 32 pounds of butter. *Springfield* — Thatcher orange butter color. *Charlemont* — Wells, Richardson & Co., 4 ounces to 500 pounds of butter. *Egremont* — Wells, Richardson & Co., $3\frac{1}{2}$ ounces to 400 pounds of butter. *Granby* — Hensen Danish butter color, $1\frac{1}{2}$ ounces to 100 pounds of butter. *Montague* — Wells, Richardson & Co., $1\frac{1}{2}$ ounces to 200 pounds of butter. *Easthampton* — Thatcher orange butter color, 2 ounces to 300 pounds of butter. *New Salem* — Wells, Richardson & Co. *North Brookfield* — Wells, Richardson & Co. *Adams* — Wells, Richardson & Co., $\frac{3}{4}$ ounce to 100 pounds of butter. *Bay State* — Wells, Richardson & Co., 3 ounces to 300 pounds of butter. *Springfield exhibition tub* — Thatcher orange butter color.

HOW MANY TIMES WAS BUTTER WASHED?

Williamsburg — Twice. *Springfield* — Twice. *Charlemont* — Twice. *Egremont* — Twice. *Granby* — Twice. *Montague* — Once. *Easthampton* — Twice. *New Salem* — Twice. *North Brookfield* — Three times. *Adams* — Twice. *Bay State* — Twice. *Springfield exhibition tub* — Twice.

DID YOU REMOVE ALL THE BUTTERMILK?

Williamsburg — Most of it. *Springfield* — Thoroughly washed. *Charlemont* — Yes, most emphatically. *Egremont* — Aim to wash it all out. *Granby* — Remove all. *Montague* — Remove enough to leave butter in proper shape. *Easthampton* — Remove all. *New Salem* — Remove all.

North Brookfield — Remove all. *Adams* — Aim to remove all. *Bay State* — Wash as clean as possible. *Springfield exhibition tub* — Wash thoroughly.

AMOUNT AND KIND OF SALT?

Williamsburg — Genesee $1\frac{1}{8}$ ounces to 1 pound of butter. *Springfield* — Genesee, 1 ounce to 1 pound of butter. *Charlemont* — Diamond Crystal, 8 pounds to 100 pounds of butter. *Egremont* — Genesee, 1 ounce to 1 pound of butter. *Granby* — Diamond Crystal, $1\frac{1}{2}$ ounce to 1 pound of butter. *Montague* — Worcester, 1 ounce to 1 pound of butter. *Easthampton* — Genesee, $1\frac{1}{8}$ ounces to 1 pound of butter. *New Salem* — Worcester, $1\frac{1}{4}$ ounces to 1 pound of butter. *Adams* — Genesee, 1 ounce to 1 pound of butter. *Bay State* — Cayuga, 1 ounce to 1 pound of butter. *Springfield exhibition tub* — Genesee, $\frac{3}{4}$ ounce to 1 pound of butter.

HOW WAS SALT APPLIED?

Williamsburg — After butter was rinsed salt was sifted on in three lots. *Springfield* — Applied on the worker. *Charlemont* — Salted in churn after second washing, one-half the salt being put upon the granules. *Egremont* — On the worker. *Granby* — In the churn. *Montague* — In the churn. *Easthampton* — On the worker. *New Salem* — On the worker. *North Brookfield* — In the churn. *Adams* — In the churn. *Bay State* — Part before starting the worker, the rest sprinkled on afterwards. *Springfield exhibition tub* — On the worker.

METHOD OF WORKING, ETC.

Williamsburg — Partially worked in churn; after standing two hours, worked with Vermont Farm Machine Company's worker. *Springfield* — Worked twice on a Mason worker, twelve hours apart. *Charlemont* — One-half the salt is put upon the granules, then the churn turned half over and the rest put upon the exposed side; then run the churn fast until mixed, and slow until gathered. Work on Vermont Farm Machine Company's worker. *Egremont* — Spread salt evenly by hand, then work about ten minutes through Mason worker. *Granby* — Work in churn four

minutes, then on hand worker. *Montague* — Butter is taken from churn to a Mason worker and from this to the cooler; in about ten hours it is worked again on hand worker. *Easthampton* — Worked once about ten minutes on National worker. *New Salem* — After working in salt on worker and standing three and one-half hours, work again on Mason worker. *North Brookfield* — Work once on Mason worker. *Adams* — Use Mason worker; work twice five hours apart. *Bay State* — Work once about seven minutes with a National worker, running four revolutions to a minute. *Springfield exhibition tub* — Work twice twelve hours apart on a Mason worker.

HOW WAS THE TUB PREPARED?

Williamsburg — Steamed, then soaked in cold water, then salt rubbed into the wood. *Springfield* — Steamed and soaked in brine. *Charlemont* — Steamed thoroughly, then soaked in cold water until thoroughly cool. *Egremont* — Soaked about thirty minutes. *Gvanby* — Soaked over night. *Montague* — Washed with hot water, soaked in cold water, then lined with paper. *Easthampton* — Scalded, then soaked thirty minutes in strong brine. *New Salem* — Soaked in cold water and lined with parchment paper. *North Brookfield* — Soaked in brine. *Adams* — Soaked over night in brine, then lined with parchment paper. *Bay State* — Soaked twelve hours in cold water. *Springfield* — Tubs scalded, then soaked with brine.

CREAM RIPENING AND BUTTER FLAVOR.

BY C. H. ECKLES, *Iowa Agricultural College, Dairy School.*

I am a trifle uncertain how to address this assembly. My knowledge of the special features of Massachusetts dairying and the Dairy Association is rather limited, as my first visit to your State was when I arrived to begin work in the dairy school. My native State is Iowa. The conditions there and in the other Mississippi valley States are of course somewhat different from your conditions. The milk business, which seems to take the attention of so many Massachusetts dairymen, is seldom heard of there, but almost every little town has a creamery. The system of operation is different from the common methods here. The milk is usually taken to the creamery and separated instead of the cream alone being gathered. The dairy business of that country has become simply enormous. According to the last report of the Iowa dairy commissioner that State has now over one thousand creameries, and sent something like 93,000,000 pounds of creamery butter outside its borders last year. This in addition to the amount which was consumed by the two and a half million people of the State.

The methods of conducting the creamery business are, as I said, somewhat different from the methods in vogue here; yet the principles remain the same. The flavor of butter is produced by the same causes in both localities, and the methods of controlling its production must be identical. The problems to be solved and difficulties to be overcome are much the same everywhere. Flavor is always the most important factor in determining the market value of butter. The difference between good and poor butter is mostly a difference in flavor. The usual system of scoring gives flavor 45 to 50 out of 100 points, showing its relative importance.

Every one of your butter-makers will agree that the hardest thing in connection with the making of good butter is to get the flavor right and uniform. One day the flavor may be as desired, possibly the next day everything is done exactly the same, but the flavor is not the same, or possibly is even very poor. Butter-makers will admit these statements as they are facts of universal experience.

In the discussion of our subject it is necessary to consider what constitutes butter flavor and how it is produced. This is necessary before the methods of controlling the flavor and securing the desired uniformity of quality are discussed. Experience and experimentation have taught us that the souring or ripening of the cream is inseparably connected with the production of butter flavor. Whether your butter is good or bad will depend mostly upon the process of ripening which has taken place in the milk and cream. We generally speak of cream as ripening, but as a matter of fact the milk ripens just as the cream, and the character of the ripening of the cream will be largely that of the ripening started in the milk. Sweet cream butter has very little flavor. Sour cream butter has a good or bad flavor, depending upon the ripening. If your butter is not good do not put the blame upon the feed of the cow, unless as, in a few cases, wild onions or strong weeds of some kind are eaten. Many experiments have demonstrated that ordinary feeds have but very little influence on the flavor. Feeds affect the color and hardness of butter, as every one has noticed when cows are first turned to pasture. Under ordinary conditions the ripening or souring produces the flavor which is found in the butter.

We will first consider what really constitutes the process of cream ripening. The process is a kind of fermentation, just as the formation of alcohol or vinegar is a fermentation. The cause of the fermentation which takes place in cream is the growth and development of an immense number of bacteria. The proper ripening of cream takes place when the right kind of bacteria produce the fermentation, and the process is allowed to proceed to exactly the right point. Some bacteria produce substances that give fine flavors, others produce butter which is almost worthless. The chemical nature of the substances constituting the flavor is not known, but it is probable they are decomposition products from the milk sugar.

In making experiments in cream ripening this last year the important connection between fermentation and flavor was fully demonstrated. To show the effect of the kind of ripening on butter flavor we took a sample of tainted milk and secured from this a pure culture of bacteria that is common in dirt and filth, possibly the most common of all; it is called the hay bacillus; its scientific name is *bacillus subtilis*. From another lot of milk another pure culture was secured, this an acid-producing species which was known to make good butter. Some cream was pasteurized; this of course removed all bacteria that could produce flavor. The cream was divided into two lots. To one was added a starter of

the dirt bacteria, to the other the one which produced good butter. The cream was ripened the same from both and the butter made the same. The butter was sent to market in tubs exactly alike. The commission merchant to whom the two lots were shipped knew nothing regarding their contents. He was asked to score and sell each on the regular market. The butter from the filth bacteria scored 83 and sold for 14 cents per pound. The other scored 95 and sold for 20 cents. Everything was the same except the bacteria which caused the ripening. Here was a difference of 6 cents per pound in the value of the butter. This was of course an extreme case, but without doubt hundreds of creameries are losing thousands of dollars each year because the cream ripens improperly, because it contains injurious kinds of bacteria. This is true in the west, and, I doubt not, is here also, and considerable of the trouble can be avoided if the creamery operator uses the proper methods. One of the Iowa dairy school instructors is often sent to creameries that are unable to produce the desired quality of butter and he assists them to fix the trouble and provide a remedy. In all cases a few days' instruction has been sufficient to raise the quality of butter to first class. At the present time we have no appropriation to pay the expense of such visits and the creameries are required to pay the expenses themselves. We are hoping to have a provision made for a travelling instructor to go from creamery to creamery the year around. The methods this instructor generally uses to correct these faults are to require strict cleanliness about the building and utensils, rejecting milk which has not been cared for in such a manner as to prevent it from becoming tainted, and by the use of good starters. These are all applications of the principles of bacteriology. This is mentioned simply to show the practical importance and application of this question for fear it will be thought practical considerations have been made secondary to theory. Although we do not stop to consider it, we are dealing with bacteria and their work in every part of the dairy industry. To a large extent our success depends upon the manner in which we are able to control them. It is well to bear in mind that almost all the tastes and odors we find in milk, other than those of natural milk, come from some kind of bacteria. Those that produce the souring of milk should be considered the special friends of the butter-maker. I fully believe this fermentation alone is the one we want for butter-making. During the past year we made a series of examinations of cream ripened under the best natural conditions when just ready for churning. We determined the number of bacteria in each cubic centimeter and the proportion which were acid pro-

ducers. This latter class we found to constitute from 90 to 98 per cent of the total number of bacteria. The cream from which the butter was made that scored second among the 500 entries at the national butter-makers' convention in 1898 was among the lot examined. When pasteurized cream was ripened with pure cultures of this acid bacteria, a first-class butter-flavor was produced with the natural high aroma.

The souring germs do not come from filth and dirt, but the dozens of kinds which do find their natural homes in such places are the ones which produce bad flavors and odors. These germs exist by the millions in the excreta from animals. We see then why cleanliness is always so very essential in all parts of the dairy industry, as was learned long ago by experience, although the real reason was not known. Although not pleasant to think about, it is undoubtedly true that the dirt and manure which get into milk are themselves not sufficient to give any taste to the butter, if there is nothing else there but the dirt. What does produce the injurious results with which we are all familiar are these bacteria that are in the dirt. They decompose the milk just as they decompose animal or vegetable bodies or whatever they may be growing in, and it is not strange that all kinds of disagreeable flavors result.

Good clean milk then is absolutely essential to produce the best results. No butter-maker can take milk foul with dirt and filth and all that goes with them and make a first-class product. There are, of course, certain ways in which such milk can be improved and the injurious results somewhat averted. What we want to produce a good butter flavor is cream that will sour with no other taste, especially of unpleasant taints suggestive of filth contamination. To secure this there are two points to be always kept in mind:—

First.—Undesirable fermentations must be kept out. This is mostly a question of cleanliness and rejection of milk that has been handled in an uncleanly condition. I cannot go into details here, but will say the filth from the cow herself which drops into the pail during milking causes a large part of the trouble in making butter. Unclean utensils probably come next. The condition of the air in which milk is kept is important, but under ordinary conditions is far less harmful.

Second.—The second point to be kept in mind is that desirable fermentations must be present. That is, those which cause a souring. Simply keeping bad flavor out is not always sufficient. The germs that produce the good flavor must be added if not already there. This is accomplished by the use of starters. As used in

dairying a starter is a portion of milk or buttermilk containing a large number of the germs of fermentation supposed to give a good flavor. The purpose of its use is sometimes to hasten the souring but its greatest value is in controlling the flavor. I consider the use of a starter as absolutely necessary if the butter-maker expects to make a uniform high-grade butter. Under the best conditions, that is, when the milk is clean, free from filth bacteria, as it is more apt to be in the summer, good butter can be made with no starter, probably sometimes just as good as with one, but at least in the State with which I am the most familiar it is almost impossible to make good butter in the winter time without a starter.

In Denmark, where butter-making is probably carried on under the most careful conditions of any, a good starter is considered of the greatest importance. As to the kind of starter to use, I would say some of the commercial starters, especially the one put on the market by Mr. Douglas of Boston, will give good results, but I believe with proper care a natural starter can be made that is just as good as any commercial starter. When a starter is in the proper condition it has a sharp acid taste, with no unclean disagreeable taste or odor. It does not whey off as soon as it thickens, but remains in a solid curd with no bubbles showing gas. The only way to tell when a starter is right is by the taste and odor, and the user should learn to judge this correctly. The method of making a skim-milk starter taught by the Iowa dairy school I think is about as successful as any. Four or five clean pint jars are filled with milk from different patrons or different cans. These are covered and placed in a warm place until they are coagulated. They are then examined and tasted, and one selected which meets the requirements as given before. Then a can of skim-milk equal to 6 or 8 per cent. of the amount of cream you expect to ripen the next day is taken. This is placed in a tank of water heated by steam until the milk reaches pasteurizing temperature, 155 degrees. It is then allowed to stand ten or fifteen minutes, then placed in cold water and cooled to 75 or 80 degrees and the selected jar of good sour milk added. If kept at the proper temperature in twenty-four hours the entire amount is soured in the same condition ready for use as a starter. The starter is kept ten days or two weeks, or as long as it remains good, by pasteurizing more milk each day and adding a dipperful of the old starter.

The temperature at which cream is ripened is not so material if the ripening is stopped at the proper stage. It can be ripened at 55 or 90 degrees. At high temperature it must be watched very

closely as ripening advances very rapidly. However, I prefer about 70 to 75 degrees in the winter time and 65 to 75 in the summer.

Some means of testing the acidity of cream is very useful. When not soon enough the butter shows a lack of flavor, if ripened too high the flavor is at times somewhat rancid. For this purpose the Mann's acid test or Farrington's tablets are useful, and especially useful to those who are somewhat inexperienced. Without some such test the butter-maker simply guesses at conditions which the average man can hardly be relied upon to interpret.

GOLD MEDAL BUTTER.

BY R. F. JAYNES, *Ryegate, Vt.*

I commenced the butter business twenty-one years ago. Thirteen years I spent in New York, and when I left there six years ago and came to Vermont I thought I was quite a butter-maker. As I look back over those thirteen years I can see I was only starting on the road to my chosen profession. I expect to learn more about butter-making in the next five years than I have in the past twenty-one. And I tell you, boys, we can get some good ideas from each other here, and by experimenting on them derive a great deal of benefit from this meeting.

It will be easy for me to tell you how I make butter, but years of experience, and especially the experience this winter at the dairy school at Burlington show that conditions vary, and you cannot make butter in just the same way everywhere. At Burlington I often churned at 54 to 56 degrees and had butter in fifteen to twenty minutes with only .06 to .12 per cent of fat in the buttermilk, while at home I have to churn forty to sixty minutes at 58 to 62 degrees, and leave .1 to .2 per cent of fat in the buttermilk.

I give the man that takes the milk strict orders not to take one can of milk that is off in any way.

We enjoy a reputation on our butter second to none in uniformity. I often have butter-men in Boston ask why neighboring creameries have butter off every once in a while, while ours is always the same. To us this is a great benefit, as we cater only to the fancy trade and must have butter of fine quality every day.

Now, starting with good milk, if your strainer becomes dirty, change for a clean one; it is hurtful to sift new warm milk through dirt or filth. It is worse than patrons leaving their cans standing in the barn exposed to undesirable odors.

I separate milk at a temperature of 75 to 80 degrees, which leaves the cream 70 to 72 degrees when the run is done. I leave it at this temperature, stirring often, as it is impossible to get an exhaustive churning unless the cream is thoroughly mixed during

the ripening process. I do not commence to cool it until it shows acid enough so I can cool it down to churning point and hold it there at least three hours before churning. I find that this is of more importance to produce an exhaustive churning than it is to the quality of the butter; why, I cannot tell.

I experimented on this a great deal at Burlington, and my highest tests of buttermilk were from cream not cooled the night before churning. I wish you would test your buttermilk from cream cooled just before churning and from cream that has stood at the churning point not less than three hours, and write me the results. I know of butter-makers that cool their cream to churning point by putting ice directly into the cream in the churn and letting it cool down as they churn. I wish they would test their buttermilk and see what the results are. Most creamery men test skim-milk often, but very few know anything about how their buttermilk tests.

Upon the right amount of acidity depends the flavor your trade demands. This is entirely a matter of individual judgment; some want a higher flavor, almost on the verge of acidity; to others high flavor means a flavor that comes from sour milk and buttermilk; others desire a clean, pure milk flavor. The true odor of perfect butter is a mild desirable flavor or combination of flavors, hard to describe and only met with in perfection under perfect conditions.

New York desires a flavor that comes from cream testing as high as 6 per cent, while my trade in and around Boston requires a little over 4 per cent acidity. Right here, in my mind, is where you lay the corner-stone upon which you must build your reputation. As flavor is about the only thing now that is scored off in our exhibits, to produce that desirable flavor depends upon condition of the milk or the ripening of the cream. I run a cream of about 35 per cent fat test and find it gives me a better flavor than a thinner cream. I will tell you why I think so. First, if milk is off in any way the more you have of it in the cream the more of the undesirable bacteria will be developed and season your butter. Then if the milk is good the trouble will be that the acid will coagulate the casein and turn it into cheese; a large amount of it will be taken up and absorbed by the globules of fat as they adhere to each other. Hence, you will have part butter and part cheese, which will give you that undesirable sour or cheesy flavor.

The butter globules are round and the surface tension keeps them separated one from another. They are supposed to be pure as they come from the cow, and are seasoned by the milk sur-

rounding them. Now if we could take the globules out as soon as the milk was drawn from the cow and put them into a pickle made of pure pasteurized milk and keep them pure until we have a sufficient amount of acidity developed to give us the desired flavor, we ought to have a perfect butter. So for this reason I run my cream as free from milk as I can, and I find that the 35 per cent cream is as heavy as I can churn and have a sufficient amount of liquid in the churn to float the butter and have it come in a granular form.

I would advise the butter-makers of Massachusetts that are not having satisfactory results to try running a cream of not less than 35 per cent fat; to try the Farrington and Ward test, and use an acidity of 45; keep cream in a clean, pure place, cool it to your churning point the last thing before you leave the creamery for the night; churn at a temperature that will bring butter in about 45 minutes in a granular form; wash once in a water not more than three degrees different from the churning temperature; work and salt about $\frac{3}{4}$ ounces to the pound. Unless your conditions are much different from mine, you ought to have a butter that will score for extras.

It is important that everything about the dairy should be scrupulously clean, for the flavor that you want to develop will not come where bad odors are allowed to exist. Butter culture I never use. I develop my flavor every day just as I want it in my cream. If for any reason you should have bad milk or poor cream you should improve the flavor of your butter by using some good starter, rushing the cream along and getting it out of the bad company it is in as soon as possible; every one is known by the company he keeps.

Making gold medal butter is not all that is needed for success in business. What good does it do to make an extra article if you cannot sell it for an extra price? To be able to do this it is necessary to visit the markets of our large cities and see your butter as others see it. It has been instructive to me to visit the butter-rooms in Boston and study the wants of the customers as they come and go.

Not long ago a buyer came in and asked the salesman if he had anything extra, and the salesman said he had an extra extra, and started to show him a pile of tubs across the room, when the buyer stopped him and said, "No, I cannot use butter put up in such dirty looking tubs, no matter how good it is; it would be too hard to convince my trade that any one would put good butter in such dirty looking packages." He bought a poorer quality of butter that was more pleasing to the eye. After he went out I examined

this butter, and found that it was a very fine goods, but the tubs had been handled with dirty hands and carried to the station in a dirty wagon ; there was also butter on the outside of the tubs.

I cannot too strongly urge you all to be particular in putting up your butter, to have it neat and attractive to the eye. Do not neglect any of the small things, then you will not be as apt to forget the large ones. The first appearance goes a great ways toward forming one's opinion of anything. I visit my customers often to study their wants. I never have any argument with my trade. I give them just what they ask for and try to please them so well that they are willing to pay me an extra price, not only for the fine quality of the butter, but for the certainty that they will get what they want when they want it.

DAIRY OUTLOOK IN NEW ENGLAND.

BY H. E. ALVORD, *Chief of Dairy Division, U. S. Department of Agriculture.*

Twenty-five years ago I began to argue for the adoption of the creamery system in New England. It is less than twenty years since the first creamery was established east of the Mississippi. To meet the competition of the west creameries became a necessity in New England.

Western competition is further increased by the extension of the creamery system to the extreme west and to the north-west, where milk and butter can be produced cheaper than in the east, and still more by the cheapness of transportation; the immense product has offered an inducement for refrigerator cars and quick-time schedules. The department of agriculture in getting butter for export found that transportation to New York was more costly from Vermont than from Kansas, Dakota, Iowa or Minnesota. No shipment from a New England creamery to New York cost as little as that coming from Iowa.

New England has certain natural advantages in nearness to market, ability to vary the product and to economize by the use of the waste products, but these advantages are offset by the higher cost of production. To remedy this, organization and co-operation are needed.

We see more rivalry between creameries than we used to between dairy farmers. This rivalry must cease or the weaker will go under. It would be better to pull together, and a union of or co-operation between the creameries is advisable; not a creamery trust exactly, but a strong organization of creameries in New England as a business concern. Groups of creameries should unite, and if necessary suspend some of the plants, using these as gathering or separating stations. As the individual farmers' churns have lessened in number, so the creameries will unite and decrease in mere numbers.

Few single creameries could bear the cost of inspecting patrons' barns, herds or methods, although it might be an economy in the end. But a group of creameries could do this just as neighboring towns unite and pay a school superintendent. No condensed milk

establishment thinks of conducting its business without this inspection. All the creameries of New England could unite in one business scheme. A first-class business man, well paid, would be needed as an agent, and on him would depend success.

The objects of this proposed organization of creameries would be as follows : —

First. — To find new markets.

Second. — To cultivate better and hold present markets.

Third. — To prevent local competition.

Fourth. — To encourage and guard specialties, such as the ice-cream and bottled cream trade. The cream trade is decidedly neglected in New England, and one or two towns are supplied with cream from Iowa. A few Maine creameries, however, have turned their attention to this feature. Pasteurized milk may be a fad, but it is a paying fad ; cultivate it. Unsalted or sweet butter also has a growing demand.

Fifth. — To improve facilities of transportation. The work of securing better rates from St. Albans to Boston is well remembered as the result of union of effort and hard work.

Sixth. — Possibly to buy creamery supplies and feed for patrons at wholesale.

Seventh. — To assist in the enforcement of the State laws.

Eighth. — To secure further legislation.

The dairy interests of New England must do something about "process" butter. It is to-day a more serious evil or threat than oleo, which is under control of the law. There is no law against "process" or renovated butter, which is sold and used like oleo in the place of fresh butter. It deceives even the shrewd buyer at first. It has a higher per cent of butter fat than creamery butter because other elements have been taken out. It often has an undue proportion of water and contains less curdy matter than fresh butter. It is almost devoid of fine flavor, having only such as is introduced by rechurning with milk. The grain is deficient because the butter has been melted. There is no better work for the Hatch Experiment Station than to discover some easy way of identifying process butter ; probably chemicals and the magnifying glass will be needed.

Pasteurizing cream for butter is but a repetition of the method used in renovating rotten and rancid butter. It is questionable whether the quality of butter or cream is as good with pasteurization as without.

New England creameries are doing comparatively well now, and they are paying patrons a higher rate for raw material than elsewhere, although this raw material costs more. Nevertheless, New

England creameries net as much as elsewhere. Now, to hold this condition much longer organization is needed. The Massachusetts Creamery Association is good as far as it goes, and is a good foundation to build upon.

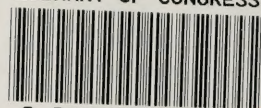
New England creameries have little interest in the export trade, for their butter is not likely to go abroad. Government experiments show that New England butter is the least profitable to export. The average market price of New England butter was higher than elsewhere, and when this was sold in Manchester or Liverpool this year, left a narrow margin. Only one lot from New England sold for enough to pay expenses. Butter which cost in Chicago nineteen cents, and in New York a little over twenty cents, sold in Manchester for twenty-four cents. Taking out one and a half cents, cost of exporting and selling, a profit of about two and a half cents was left.

Every pound of butter or cheese which can be got out of the country is of benefit to the New England creameries. The government has been at work for two years on this business. At first there was Australia, Canada, Denmark, Sweden and a part of Ireland to compete with. But at the present time the only rival is the Danish butter.

This much having been accomplished, attention is being turned to Honolulu, Japan and China, where agencies are being established. This will relieve the surplus of the Pacific coast.

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